The OAS Newsletter

A supplement to *The Ohio Journal of Science* (June 1993) for the members of the Ohio Academy of Science

Inside:

Announcement:

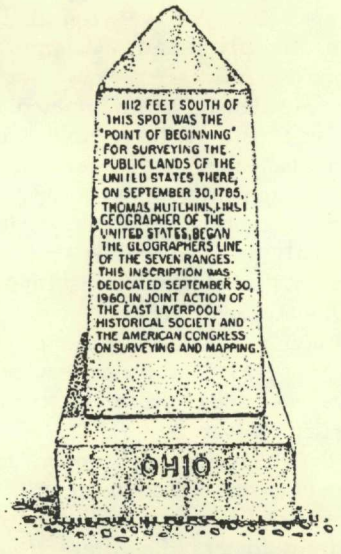
New Constitution Helps Map Future of The Ohio Academy of Science: From the Newtonian View to the Quantum View

Lynn E. Elfner
Chief Executive Officer
The Ohio Academy of Science

Editor's Note: On Saturday, 1 May 1993, members of The Ohio Academy of Science adopted a new constitution which does the following: 1) creates the Governing Council, the Industrial & Business Council, the Senior Academy Council, and the Past Presidents' Council; 2) redefines the membership of the Executive Committee to assure representation of industry, government, and academia; 3) redefines the membership of the Junior Academy Council to include pre-college student representatives; 4) vests responsibility for membership with the Membership Committee, the membership of which is drawn from the Executive Committee; 5) defines the position of Chief Executive Officer; 6) creates a Marketing and Communications Committee, and a Personnel Committee; 7) redefines the status of Fellowship by requiring special service to the Academy; 8) creates a new objective "to encourage interaction among and between scientific, engineering, technological, and educational fields"; 9) substitutes administrative divisions for sections; and 10) establishes a mail ballot voting procedure.

For fragmentation is now very widespread, not only throughout society, but also in each individual; and this is leading to a kind of general confusion of the mind, which creates an endless series of problems and interferes with our clarity of perception so seriously as to prevent us from being able to solve most of them .... The notion that all these fragments are separately existent is evidently an illusion, and this illusion cannot do other than lead to endless conflict and confusion.

—David Bohm
British physicist



Not far south of Youngstown, OH—the location of the 102nd Annual Meeting of The Ohio Academy of Science—is East Liverpool. Near East Liverpool is a monument which marks the beginning of the survey in 1785 of public lands by Lt. Thomas Hutchins called the Seven Ranges survey. This became the start of the American rectangular survey system which was later used in much of the West. The paradigm of rectangular coordinate mapping was the plan which, even today, continues to have a direct impact on the assessment of taxes, school funding, the

Continued on page B

New Constitution . . .

Continued from page A

arrangement of roads, and the layout of sections, townships, towns, and villages for a significant portion of the population of America. Much of the settlement of the Northwest Territory rests on the sectional "grid" established in 1785 not far from Youngstown, OH. Just as the paradigm of the "grid" for land development has served the Nation well for more than 200 years, the objectives and the plan of organization of The Ohio Academy of Science, embodied in the Academy's Constitution, has served the Academy well for over a century.

But the world is changing. And science, technology, and education are fostering that change.

The views of ourselves, our world, and our universe have been shaped by our knowledge and understanding of Nature developed by science and technology and fostered by education. Each year it becomes apparent to more people that there are relationships between all of our actions. Simply stated, we cannot do just one thing.

The Academy has maintained five objectives for a century. Now a new objective has emerged to guide our action: to encourage interaction among and between scientific, engineering, technological, and educational fields. Moreover, the Substitute Constitution of The Ohio Academy of Science, approved by Academy members at the Youngstown Annual Meeting, is clearly what the title states—a substitute for the structure of the first century.

Rather than relying only on the "grid" system of technical sections upon which the Academy has been built, our new paradigm fosters the interaction of industry, government, and academia. This is in line with the growing understanding that the boundaries between what was once considered basic science and the application of science are blurred. Clearly, each benefits from the other.

Moreover, the problems of society—environmental degradation, economic development, global warming, maintenance of biological diversity, education, health care, energy use—are of major concern and interest to most scientists, engineers, and educators. The solutions to these problems, many of which require a solid grounding in science and technology, will be more likely carried out if professional societies like The Ohio Academy of Science can encourage interaction among and between scientific, engineering, technological, and educational fields.

When members voted for the Substitute Constitution of The Ohio Academy of Science they were like Lt. Thomas Hutchins in 1785 whose work influenced in significant ways the development of the Northwest Territory. Their vote set in place a new plan to map the future of The Ohio Academy of Science. That new plan has less to do with the old "Newtonian" world, straight-line thinking in which we divided the scientific world into sections much as the map makers in the Old Northwest divided the land into sections, and more to do with the "Quantum" world, relationship-thinking in which we see waves of change and invisible or immeasurable, yet real, relationships.

This change in thinking about organization is best described by Margaret J. Weatley in her new book, ***Leadership and the New Science: Learning about Organization from an Orderly Universe,*** in which she writes:

In our day-to-day search for order and prediction, we are driven crazy because of non-local causality. In spite of the best of plans, we experience influences that we can't see or test, and strange occurrences pop up everywhere. We have broken things into parts and fragments for so long, and have believed that was the best way to understand them, that we are unequipped to see a different order that is there, moving the whole. British physicist David Bohm captures this dilemma when he says, "The notion that all these fragments are separately existent is evidently an illusion, and this illusion cannot do other than lead to endless conflict and confusion."

At present, our most sophisticated way of acknowledging the world's complexity is to build elaborate systems and process maps, which are often influenced by a Newtonian quest for predictability. If we create the map to reveal all the variables, and expect that from such knowledge we will be able to manipulate the system for the outcomes we desire, we are thinking like Newton. What we hope for is not possible. There are no routes back to the safe harbor of prediction—no skilled mariners able to find their way across a deterministic ocean. The challenge for us is to see beyond the innumerable fragments to the whole, stepping back far enough to appreciate how things move and change as a coherent entity. We do, after all, live in a very fuzzy world, where boundaries have an elusive nature. The now-you-see-it, now-you-don't quality of these boundaries will continue to drive us crazy as long as we try to delineate them, or to decipher clear lines of cause and effect between well-bounded concepts.

There are no familiar ways to think about the levels of interconnectedness that seem to characterize the quantum universe. Instead of a lonely space, with isolated particles moving about, space appears filled with connections. This is why the metaphors turn to webs and weavings or to the world as a great thought. Gravity is an everyday example of "action-at-a-distance," and scientists have created other "fields," unseen forces that structure space, to explain the connections they observe. In an important way, though, even as we construct different field theories, we are still locked into a parts mentality, trying to explain how separate things join together. The more provocative view, expressed in Bohm's work, is that at a level we can't discern, there is an unbroken wholeness. If we could look beneath the surface, we would observe an "implicate order" out of which seemingly discrete events arise.

I believe the evolving emphasis in our society to "think globally, act locally" expresses a quantum perception of reality. Acting locally is a sound strategy for changing large systems. Instead of trying to map an

Continued on page C

The OAS Newsletter

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Science Academy Selects Women in Science, Engineering, and Mathematics

In May, The Ohio Academy of Science named 18 women in science, engineering, and mathematics who will serve as role models and mentors to inspire young Ohio women to choose science related careers. This latest announcement brings the total to more than 280 who are considered EXEMPLARS by the Academy.

Despite recent progress, women remain underrepresented in most technical professions. One strategy to solve this problem is to present young women with inspiring examples of women who are achieving in science related careers.

Two criteria were used to select the EXEMPLARS: excellence in their fields of interest and the ability and willingness to serve as mentors.

EXEMPLARS are employed by many different employers including corporations, hospitals, colleges and universities, public and private schools, and government agencies.

The mission of The Ohio Academy of Science is to empower curiosity, discovery, and innovation for the 21st century.

The newly selected exemplars are: **Pamela Sue Lane** from Brecksville, employed by The BFGoodrich Co.; **Annette M. Barzal**, Brunswick, Brunswick City Schools; **Amy Marie Elfner**, Delaware, The Ohio State University; **Kelly Liane Legg**, Hilliard, Fairbanks Local High School; **Charlotte K. Hopkins**, Kettering, Kettering Board of Education; **Tina R. Partin**, Lebanon, Sinclair Community College/Sycamore Hospital; **Jane Bricker Maczuzak**, North Ridgeville, Lake Ridge Academy; **Theresa A. Goubeaux**, Piqua, Piqua City Schools; **Joyce M. Thornberry**, Piqua, Piqua Catholic Schools; **Mary Edna Leistner**, Sidney, Sidney City Schools; **Margaret Raub Hunt**, Strongsville, Strongsville City Schools; **Patrice Gail Fraker**, Toledo, Medical College Hospitals; **Joanne Guyton-Simmons**, Toledo, Medical College of Ohio; **Sandra S. Kline**, Toledo, Medical College Hospitals; **Martha J. Pituch**, Toledo, Medical College of Ohio; **Lydia D. Schafer**, Toledo, Medical College of Ohio; **Dee N. Leis**, West Milton, Tipp City Central Intermediate MS; and **Pei-Hsing Lin Wu**, Worthington, Ohio Board of Regents.

New Constitution . . .

Continued from page B

elaborate system the advice is to work with the system that you know, one you can get your arms around. If we look at this strategy with Newtonian eyes, we would say that we are creating incremental change. Little by little, system by system, we develop enough momentum to affect the larger society.

A quantum view would explain the success of these efforts differently. Acting locally allows us to work with the movement and flow of simultaneous events within that small system. We are more likely to become synchronized with that system, and thus to have an impact. These changes in small places, however, create large-system change, not because they build one upon the other, but because they share in the unbroken wholeness that has united them all along. Our activities in one part of the whole create non-local causes that emerge far from us. There is value in working with the system any place it manifests because unseen connections will create effects at a distance, in places we never thought. This model of change of small starts, surprises, unseen connections, quantum leaps—matches our experience more closely than our favored models of incremental change.

The quantum leaps that we speak of so glibly also teach about quantum interconnectedness. Technically, these leaps are abrupt and discontinuous changes, where an electron jumps from one atomic orbit to another without passing through any intermediate stages. Exactly when the leap will occur is unpredictable; physicists can calculate the probability of a jump occurring, but not precisely when it will take place. What is at work here, though we cannot observe it, is a whole system creating the conditions that lead to the sudden jump. Because we don't know and can never know enough about the whole movement, we can never predict exactly how its influence will be manifest. This is hardly a comforting thought to those of us trying to manage organizations, yet quantum leaps reflect our experience of organizational change with more accuracy than we commonly acknowledge.

My growing sensibility of a quantum universe has affected my organizational life in several ways. First, I try hard to discipline myself to remain aware of the whole and to resist my well-trained desire to analyze the parts to death. I look now for patterns of movement over time and focus on qualities like rhythm, flow, direction, and shape. Second, I know I'm wasting time whenever I draw straight arrows between two variables in a cause and effect diagram, or position things as polarities, or create elaborate plans and time lines. Third, I no longer argue with anyone about what is real. Fourth, the time I formerly spent on detailed planning and analysis I now use to look at structures that might facilitate relationships. I have come to expect that something useful occurs if I link up people, units, or tasks, even though I cannot determine precise outcomes. And last, I realize more and more that the universe will not cooperate with my desires for determinism.

The new constitution of The Ohio Academy of Science sets the conditions for what we hope will be a quantum leap to a new level of organization and excitement. Although we cannot calculate the precise probability of when that leap will occur, we are confident that our estimation skills are good enough to say with certainty that the quantum leap we all want will more likely occur under the quantum world view than in the Newtonian system we used for the past century.

Science on the Radio: Airwaves of the Future?

A new AAAS-produced radio show for kids promises to make learning science as easy as turning on the radio. Using science, the "Kinetic City Super Crew" solves mysteries for their young audience. Geared towards children ages 8-10, the four pilot programs are now airing on a new children's radio station, The Radio Zone, which can be heard on 1050 AM in Maryland and Washington, DC, and 1460 AM in Northern Virginia. "Kinetic City Super Crew" also features experiments that kids can try at home as well as several short features related to the show's theme. AAAS is currently seeking additional funding to produce 39 episodes annually as well as to market the program to stations throughout the United States.

Recruiting Our Replacements: Support of Regional and State Science Days

by Lee A. Meserve, *OJS* Editor

Any of us who have participated in District or State Science Days in some capacity—participant, mentor, judge, et al.—share the feeling that the system of "science fairs" in Ohio is one of the better (if not the best) organized and administered in the nation. The concerns of those employed in the sciences, be the setting academic, corporate, or governmental, that our generation will be difficult to replace are allayed a bit by the collective enthusiasm, effort, and expertise of bright young people from junior and senior high schools throughout the state. Recruitment of judges for these events is always a major task, and this year's round of Science Days resulted in a state-wide flurry of editorial pieces in newspapers to this effort. Three of these opinions follow. Please read them and take their message to heart by volunteering and encouraging colleagues to volunteer to serve as a judge at one or several of these Science Days during spring, 1994. A schedule of District Science Days can be obtained from the OAS office. Try it, you'll like it!

Actions Deceive Education Value

by Rebecca L. Evans

(*Oxford Press*, 15 April 1993, Oxford, OH)—Do Americans really value education? If we judge by actions, the answer is probably "no." Saturday, March 27th was the 46th Annual Southwestern Ohio District Science Day and the 5th Southwestern Ohio Science and Engineering Fair at Miami University. This Science Fair exhibits the efforts of young productive, creative, and inquisitive minds—the future problem-solvers of our country. It offers a chance for the world to see what today's young people are capable of producing. It also provides an opportunity for the businesses and community to give well-deserved kudos and encouragement to the best and brightest—to send the message that education is important and rewarding.

When I read the paper and see the letters from the public decrying the state of education, I wonder where are these people when it comes to supporting and participating in important educational experiences. Only a small percentage of kids take part in doing science projects these days, but the skills gained from this activity are invaluable—learning to analyze and to do quality research, and how to think logically and clearly present convincing arguments for discoveries made. Few parents urge their kids to take part in these projects when the opportunity is available and when their kids do present their exhibits, many of their parents won't even come to the fairs to share their child's moment of pride.

Many science teachers won't sponsor or judge science fairs unless it is absolutely mandatory. They do require a lot of time for preparation and the teachers are given little financial or volunteer assistance. Often lack of science fairs isn't the teachers fault because school boards are more concerned with whether these teachers can coach desired sports than if they can sponsor science fairs. This gives erroneous message that brawn is more important than brains. NOT!

Getting judges is often a problem. It is a major shame that universities and research facilities don't readily volunteer 50 percent plus of their staffs each year. At Miami University where the Southwestern Ohio District Science Day is held most science departments were barely represented and some departments could not muster any judges at all. Kids have a right to be judged by the best in the field. These people can give the best constructive criticism and aid in a valuable learning experience. By not having enough scientific professionals volunteering to judge in their respective fields, a negative message gets exchanged. The professional sends the message that the effort to educate the young and future leaders of society is not worthy of his/her time and attention. And the young student receives the message that his/her work is insignificant and perhaps even a waste of time. This is the road to discouragement from pursuing academic efforts which may benefit us all in the future.

The fair offers a couple of hours of public viewing. This is a chance for the public to add to its education. It is also a chance for people to see what youngsters are capable of doing and to check to see if their own kids are working up to their potential.

Finally, where were the media? I always felt the media had a social and moral obligation to report the important events to society—to keep the public informed and to educate. The media should have put forth a good advertisement or story article prior to the event and then given coverage during the fair. The future job market demands ever increasing academic and technological skills. The society has ever

Continued on page G

Federal Guidebook Now Available

Students, teachers, and parents now have access to a comprehensive listing of educational resources in their local area, as well as throughout the nation.

The "Guidebook to Excellence—A directory of federal facilities and other resources for mathematics and science education improvement" was released recently at a White House press conference. Copies of the guidebook may be obtained by calling or writing the contact listed below.

The Guidebook to Excellence enables teachers, parents, and students to take advantage of the federal laboratories, scientists, and equipment made available by executive order.

Admiral James D. Watkins, secretary of the Energy Department and chairman of the Federal Coordinating Council for Science, Engineering, and Technology, Committee on Education and Human Resources (FCCSETCEHR) said, "Imagine how useful the Guidebook will be. A teacher or parent anywhere in the U.S. can now look up those nearby federal laboratories and other state and regional facilities that sponsor science and mathematics initiatives, and obtain the name and phone number of someone who can help. Using this directory, students of all ages will be able to take advantage of the tremendous scientific resources the federal government has to offer."

Educators, parents, and anyone else wishing to receive a copy of the Guidebook to Excellence should write to the Office of Scientific and Technical Information, P. O. Box 62, Oak Ridge, TN 37831.

FINALISTS SELECTED IN 52nd WESTINGHOUSE SCIENCE TALENT SEARCH

In January, the forty finalists in the 52nd annual Westinghouse Science Talent Search were announced by Dr. Alfred S. McLaren, president of Science Service, Inc.

The Talent Search is sponsored by Westinghouse Electric Corporation in partnership with Science Service, Inc., a nonprofit Washington organization dedicated to increasing public understanding of science, especially among youth and members of traditionally underrepresented groups.

The Search is the oldest high school science scholarship competition in the United States, with five former winners having won the Nobel Prize, two having earned mathematics' highest award (the Fields Medal), and eight having won MacArthur Foundation Fellowships (known as the "genius awards").

This year entries were received from 1,662 students in 684 schools representing 48 states, the District of Columbia and Puerto Rico. Three hundred of the most talented students, 172 young men and 128 young women, were announced as semifinalists on January 19. All 300 semifinalists receive special honors certificates, and their names are provided to colleges and universities throughout the nation. Admissions officers have long regarded this list as a valuable tool for selecting highly promising students and awarding financial aid.

"This country's national competitiveness hinges more than ever on our leadership in the sciences," said Paul E. Lego, Westinghouse Chairman and Chief Executive Officer. "Corporate America must play a role in helping to recruit and nurture a new generation of scientists—those who will revolutionize our lives and be the future leaders in education, business, and government.

As the longest running program of its kind in the nation's history, the Westinghouse Science Talent Search has helped create the environment necessary to stimulate intellectual curiosity in young people and to stir their enthusiasm for science careers. Over the years, its participants have represented an exciting cross-section of intelligent and motivated teenagers. And it is our hope that 'The Westinghouse' will continue to be a beacon to the most talented high school students, showing them that the study of science is important and rewarding."

New York State, which had the largest number of entries—779—also had the most semifinalists with 124. Maryland and Texas were second with 17 semifinalists, followed by Florida and Virginia both with 15, and Illinois with 13. This year's semifinalists represent a total of 180 high schools across the country.

"The Search has identified young scientific talent during the past 52 years with remarkable precision. STS alumni have won many of the world's most coveted science and math awards," said McLaren. "Perhaps the most exciting thing about the Westinghouse Science Talent Search is that these students, from all over the country, represent a new generation of young Americans. Their selection is not only a tribute to their enthusiasm,

Continued on page F

Attention Taxonomists and Field Biologists

The Ohio Biological Survey (OBS) would like to invite interested taxonomists and field biologists who have taxonomic expertise in one or more groups of biological organisms to join the BioSurvey Network.

The purpose of the BioSurvey Network is to serve as a manpower pool for biological survey teams. These teams will conduct biological surveys and inventories, primarily on a contract basis. Once a member of the BioSurvey Network, your participation in any contract or non-contract work is voluntary. Persons performing contracted field or museum/herbarium work will be compensated for labor and expenses via a subcontract. The role of the Ohio Biological Survey is to coordinate and communicate within the BioSurvey Network, and to manage the contracts.

This is also an opportunity for you to involve and educate undergraduates, graduate students, and interested members of the public. If you are interested in joining the BioSurvey Network, please provide the information requested below, and return this form to the Ohio Biological Survey, 1315 Kinnear Road, Columbus, OH 43212-1192.

NAME: _____

ADDRESS: _____

_____

_____

_____

TELEPHONE: _____

FAX: _____

[Please write questions or additional comments on a separate page.]

Areas of Taxonomic Expertise

_____

_____

_____

_____

Areas of Participation (Y/N):

Field Survey Work only: _____

Lab/Museum/Herbarium Work only: _____

Both Types of Work: _____

Nutrition in the Nineties in The Ohio Academy of Science

Increased interest has been shown in nutrition research at the past two annual meetings of The Ohio Academy of Science. Last year, a luncheon meeting of a Nutrition Interest Group (NIG) was organized by Dr. Kelly Kohls of Miami University. This year, several papers which dealt with nutrition were presented at the meeting. The topics covered a range of subjects such as mineral bioavailability and nutrition-immune system interactions. In an effort to foster this heightened attention to nutrition at a state level, Dr. Kohls and Dr. Robert DiSilvestro will promote nutrition related activities within the Academy. Dr. DiSilvestro, a relative newcomer to Ohio who arrived here three and a half years ago, is a faculty member at The Ohio State University in the Department of Human Nutrition and Food Management.

Dr. Kohls and Dr. DiSilvestro hope that enough nutrition related papers will be submitted for next year's meeting to allow for one or more full sessions concerning nutrition. Another Nutrition Interest Group luncheon is also planned. To make these endeavors successful, they request that current Academy members encourage nutrition colleagues to participate in next year's meeting.

If you have suggestions, want to help with planning, or have any questions, contact Dr. Kelly Kohls, Miami University, 164 McGuffey Hall, Oxford, OH 45056. Phone: 513/529-4919.

Spring 1994 Kent State University Will Offer "Winter Environments at the Arctic Treeline" Workshop

Discover one of the most distinct and important ecological boundaries in nature. The arctic treeline extends more than 10,000 km across Alaska, Canada, Norway, Finland, and Russia. Cold summer conditions around Canada's Hudson Bay cause the arctic treeline to reach its most southern extent in the vicinity of Churchill, on the Bay's west shore. Here, you will find the junction of three major ecosystems—the boreal forest, the arctic tundra, and the arctic tidal waters of the Hudson Bay. Churchill is 900 km north of Winnipeg and is accessible only by train, plane, or boat.

Travel with Dr. Thomas Schmidlin, associate professor, Department of Geography at Kent State University in a workshop entitled **"Winter Environments at the Arctic Treeline"** (worth 4 graduate or undergraduate credit hours). Our base of operations for this workshop will be the Churchill Northern Studies Centre. This comfortable, modern research facility has a dormitory, cafeteria, laboratories, and lecture rooms.

Travel to Churchill February 11 and spend February 12-15 in the field and lab studying the harsh winter environment at the arctic treeline. During February 16-20, participate in the Third Symposium on Circumpolar Ecosystem in Winter and Arctic Workshop. The biennial symposium and workshop brings 30-40 scientists to Churchill to discuss their latest research on winter environments of the polar lands and seas.

In addition to attending formal presentations of arctic research, you will spend evenings filled with tales of northern adventures, videos of arctic wildlife, crafts of the Inuit, and the northern lights. You will have the opportunity to build and sleep in a traditional igloo and eat traditional Inuit food of caribou and arctic char.

For more information or to register, please call the College of Continuing Studies, Kent State University, 216/672-3100, or toll-free in Ohio at 1-800-672-KSU2.

Talent Search . . .

Continued from page E

dedication, and hard work, but to the teachers and parents who encouraged and supported them. The Westinghouse competition has always identified young people with potential. The achievement of these semifinalists and finalists bodes well for our future—not just for the future of the scientific community but for the country and the world."

The 40 finalists, 13 females and 27 males, come from 20 states, 36 schools, and 33 cities. New York leads the list with 7 finalists; Maryland with 5; and Virginia with 4. Four finalists were born outside of the United States, with one each from the Republic of China, the Peoples' Republic of China, Vietnam, and South Korea. Eighteen of the 36 schools in this year's Search had not placed finalists in previous years, and are commended for encouraging and supporting these top-level students and making it possible for them to gain this honor and recognition.

The 18 schools appearing on the winning list for the first time are: COLORADO, Fairview High School (Boulder); FLORIDA, Pensacola High School (Pensacola); HAWAII, Punahou School (Honolulu); INDIANA, Edgewood High School (Ellettsville) and Indiana Academy for Science Math, and Humanities (Muncie); MARYLAND, Eleanor Roosevelt High School (Greenbelt); MINNESOTA, Aitkin High School (Aitkin), Spring Lake Park Senior High School (Minneapolis), and Wayzata Senior High School (Plymouth); MISSISSIPPI, Saint Andrew's Episcopal School (Jackson) and Long Beach Senior High School (Long Beach); NEW YORK, Hebrew Academy of the Five Towns & Rockaway (Cedarhurst); **OHIO, Hudson High School (Hudson)**; TEXAS, Texas Academy of Math & Science (Denton) and Dunbar High School (Ft. Worth); VIRGINIA, Mount Vernon High School (Alexandria) and Radford High School (Radford); WISCONSIN, Washington Park High School (Racine).

Ohio Has a Winner!

Details of Ohio Entrant

Daniel Cramer Stevenson, 17, of Hudson, OH, entered a physics project, "Electrochemical Deposition Simulated by

Continued on page H

State Science Days . . .

Continued from page D

increasing hosts of problems which need brainpower to solve them. Why doesn't the media cover activities which truly are in the best interest of society? Instead we get endless coverage of school sports which in the course of worldly events will not matter one iota.

If we really value education, let's do better next year! Let's participate, sponsor, volunteer to judge, give good media coverage, and applaud!

There is a Need for Science Projects

Second Thoughts by Norm Burns

(*Bryan Times*, 23 April 1993, Bryan, OH)—For the past 20 years, it has been my pleasant task to have served as the State Chairman of Science Fairs for the Ohio Dental Association.

During this period of time, the number of projects qualifying for state has increased dramatically. More than 800 were judged this past Saturday at State Science Day on the campus of Ohio Wesleyan University. The special awards category has grown from 35 in 1975 to 101 this year. The sponsoring organizations, which includes the Ohio Dental Association (one of the first) give nearly $300,000 in scholarships and cash.

Science Fair is alive and healthy in most school districts in Ohio—not so, locally.

So what? The consequences?

If our educational system is to provide the next generation of scientists and engineers, shouldn't those inquiring minds be involved in a science fair project today?

What better basis for research and development at the college level and beyond.

Japan—here we come! Maybe.

A successful science fair program is **work** and requires a **team** effort—the student, the teacher, the parents, and the community (i.e., judges and sponsoring organizations).

I propose that the Bryan School system once again make mandatory at least one science fair project as a requirement for graduation. I further recommend that the 7th and 8th grade students be especially encouraged to participate in the program.

Consider the categories for a science project: The behavioral and social sciences; chemistry and biochemistry; botany; computer science; earth and space science; engineering; environmental science; math; medicine; dentistry; health; microbiology; physics; zoology.

With such a varied assortment of categories, shouldn't every student find a topic of interest?

Projects are judged as follows:

Superior (necessary at District to proceed to State)

Excellent (minimum necessary to proceed to District)

Good, and finally, Satisfactory.

The consequences of a superior or excellent rating are obvious.

How about a rating of good or of satisfactory? Hopefully, the student returns the following year and improves. If not, he or she was at least involved in the scientific process and has, at the same time, expanded his vocabulary.

Words like "hypotheses," "premise," "postulate," "supposition," "proposition," "data," "theory," "phenomena," "analysis," "conclusion," "documentation," etc. have become more meaningful.

Apathy and indifference, if permitted to become ingrained in today's youth, can only result in tomorrow's struggling adult when it may be too late to change.

Brain Power is our country's greatest natural resource. Let us not squander it!

Academic Boosters, I challenge you!

P.S. Kudos to the students from Hilltop and Stryker who were chosen for State and to Lorraine Oxender who won the first place award from the Ohio Dental Association.

Paucity of Judges has Science Fairs Fighting to Survive

Bunsen Burners by Michael B. Lafferty

(*The Columbus Dispatch*, 2 May 1993, Columbus, OH)—Are the scientists of today leaving the scientists of tomorrow in the lurch? It might look like it, especially with the unfortunate withdrawal of Battelle Memorial Institute, Otterbein College, and Denison University from the science fair scene.

Battelle withdrew its support from the Battelle-Otterbein Science Fair, which drew student projects from central Ohio. The fair wasn't held at all this year, because of Battelle's withdrawal and also because Otterbein couldn't find faculty members and others in the community to devote their time to the fair.

The Battelle-Otterbein decision was a mutual one but it also was made easier, according to Otterbein, because of the Ohio Academy of Science's decision to expand its own science fair program this year.

Battelle says it wants to evaluate its science education expenses. The international research giant still plans to continue its support of science education in schools. In 1992, Battelle contributed $425,000 to classroom science education so the $5,000 it spent on the science fair wasn't much.

Battelle, for its part, explains bowing out of the local science fair scene by pointing out that the number of student projects had declined drastically in the last few years.

Science fairs aren't the only way to interest students in science anymore, said Barbara Sills, Battelle's director of community relations.

No, but the student who is interested enough to be a scientist in school is more likely to be a scientist in the future.

Staffing the Ohio Academy of Science fairs also is becoming increasingly difficult. This was the last year for the OAS fair at Denison University, in large part because George Gilbert, who has run the fair, can't find enough help.

Gilbert had 100 volunteer judges and it still wasn't enough. It's surprising because Denison is in a community loaded with science professionals. Lots of other small colleges are nearby.

Gilbert's problem was so severe he had to ask parents and other people in the audience at the Denison show to volunteer as judges. That's fine if the parent knows something about science, but not much better than procuring a warm body if not.

But it's not just college faculty. Doctors, veterinarians, engineers, teachers, chemists, biologists, and medical technologists all have a role to play in raising our next generation of researchers. Gilbert, in particular, believes science teachers should devote more attention to the fairs.

The Ohio Academy of Science may ask Kenyon College, Mt. Vernon Nazarene College, or some other small college in the area to host the 1994 event but that won't solve the labor problem since Gilbert has been trying to entice judges from other area colleges for years.

At their best, judges are professional mentors. The more judges, the more time they have to spend with students. That's

Continued on page H

Stephen J. Gould Receives First David S. Ingalls, Jr. Award for Excellence

Dr. Stephen J. Gould, award-winning author, geologist, and evolutionist, was honored by The Cleveland Museum of Natural History on May 27 when he received the Museum's first David S. Ingalls, Jr. Award for Excellence. This new award is given for excellence in research, education, or conservation in one of the fields of natural science represented by the Museum. The individual chosen must have made a major contribution that is recognized by the national or international scientific community.

The award is named for the late David S. Ingalls, Jr., who was President of the Museum's Board of Trustees from 1979 to 1992. Nominations for the award are made by members of the Museum, staff, and volunteers.

Dr. Gould teaches biology, geology, and the history of science at Harvard University, but he is best known to the general public through his essays that have appeared in *Natural History* magazine since 1974. These brilliant insights, anecdotes, and revelations on natural history were later compiled into five books; the most recent is *Eight Little Piggies*, published this year by W. W. Norton. The earlier books, *Ever Since Darwin*, *The Panda's Thumb*, *The Flamingo's Smile*, and *Hen's Teeth and Horses Toes*, received wide acclaim. He is the author of numerous other books and scientific articles and often lectures to standing-room-only audiences.

Gould is best known to scholars for his theory of punctuated equilibrium, developed in the 1970s with Niles Eldredge, Curator of Invertebrates at the American Museum of Natural History in New York. Gould is know as the champion of this theory, which postulates that evolution occurs by a process of long periods of stasis followed by rapid change to a new equilibrium. It is a theory that has put him sharply at odds with prevailing Darwinian orthodoxy.

The award, symbolized this year by a lively bronze frog, was sculpted by Larry Isard, the Museum's Assistant Director. Following the presentation, Dr. Norman Newell, Gould's mentor and dissertation advisor at Columbia University, spoke about Gould's many accomplishments. Newell is presently curator *emeritus* of invertebrate paleontology and historical geology at the American Museum of Natural History.

Gould received his undergraduate degree from Antioch College in Yellow Springs, OH, and his doctorate from Columbia University. He has won the National Book Award, the National Book Critics Circle Award, and twice received the Phi Beta Kappa Science Award. He has served as associate editor of *The Journal of Evolution*; as an editorial board member of *American Naturalist*, *Paleobiology*, *Science*, and *Systematic Zoology*; and as an advisory board member of the Children's Television Workshop and *Nova*. He holds honorary degrees from 22 colleges and universities and is a Fellow of the American Association for the Advancement of Science and the Academy of Arts and Sciences.

Derek Bickerton, in a recent *New York Times* book review of *Eight Little Piggies*, wrote, "Few writers of popular science have given more pleasure to more readers than Stephen Jay Gould."

OAS Executive Committee Members 1993-1994

We are pleased to welcome the following Academy members who have been elected to The Executive Committee. The year 1993 is the first in recent history during which ballots for these offices were sent to the entire Academy membership.

Ronald L. Stuckey, President-Elect; **Marion Keyes, IV.**, 1993-95 Industry Representative; **David Hoeflin**, 1993-94 Industry Representative; **Anne Wickham**, 1993-95 Government Representative; **Paul Baumann**, 1993-94 Government Representative; **Irwin Ungar**, 1993-95 Academia Representative; **Vic Mayer**, 1993-94 Academia Representative.

Congratulations!

Ohio's Talent Search Winner . . .

Continued from page F

Generalized Diffusion-Limited Aggregation," in the Science Talent Search. Using computer simulations, he investigated the potential of generalized diffusion-limited aggregation, a process by which particles diffuse randomly and then aggregate, to produce a wide variety of fractal structures. He then compared these structures to the diverse geometries observed in actual electrochemical deposition. He also compared the kinetics of the simulation and the experiment.

A student at Hudson High School and a member of The Ohio Academy of Science, Daniel is active in the science and math clubs, plays violin in the orchestra, and is managing editor of the school newspaper. He has achieved numerous science and leadership awards, including the Rensselaer Science Medal for outstanding junior science student, and the best physics student award of the American Association of Physics Teachers. At the 43rd International Science and Engineering Fair, Daniel received Third Award sponsored by National Taiwan Science Education Centre, and Third Award sponsored by Science Service–Physics for his project, "Fractal Structures Generated by Passivated Aggregation." A member of his school's winning SuperQuest team, Daniel plans to study physics at MIT. He is the son of Dr. James F. and Stefanie H. Stevenson.

State Science Days . . .

Continued from page G

what Peggy Sheets, chairman of the Upper Arlington High School science department liked about the fair at Otterbein. Battelle researchers also acted as judges and were able to spend more than the normal 15 minutes or so with each young researcher.

The publish-or-perish phenomenon may be rearing its head again at small colleges, which long prided themselves on teaching excellence and community service. Small college trustees, not satisfied that faculty are doing enough by being good teachers, are looking for world-class research, too. Faculty, already loaded with teaching, advising, committee assignments, and extra-curricular student activities may find giving up the science fair provided them with a much-needed Saturday off.